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10/553,574	08/29/2006	Hendrik Dohle	23387	1571

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/553,574
Filing Date: August 29, 2006
Appellant(s): DOHLE ET AL.

Andrew Wilford
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 19, 2009 appealing from the Office action mailed October 10, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

WO2003/081707	Kosako et al.	10-2003
US2004/0209155	Kosako et al.	10-2004
US2002/0009627	Smotkin	01-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. Claims 3, 4, 8 and 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Kosako et al. (WO 03/081707).

Regarding claims 4 and 8, Kosako discloses an electrolyte membrane electrode assembly for a fuel cell, which comprises an anode, a cathode and an electrolyte, comprising an anode-side catalyst layer (94) and a cathode-side catalyst layer (96) provided on both sides of a polymer electrolyte membrane (91) (opposite face of the cathode away from the anode) which initiates the transport of protons in the fuel cell. See paragraph 2 and 3. Kosako teaches an anode-side diffusion layer (93) and a cathode-side diffusion layer (95) having electronic conductivity. See paragraph 2 and 3 and see figure 12b. The cathode-side diffusion layer has projections (99) that are

directly in contact with the electrolyte membrane. See paragraph 12 and figure 12b. A fuel cell comprises a separator (104 and 105) (free cathode compartment) bonded to the fuel cell. See figure 8 and paragraph 95. A method to operate a low temperature fuel cell is also taught.

Regarding claims 3 and 9, Kosako discloses that the gas diffusion layers comprise carbon paper or carbon cloth (ion conducting and proton conducting material).

Claim Rejections - 35 USC § 103

2. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosako et al. (WO 03/081707) as applied to claims 3, 4, 8, 9 above, and further in view of Smotkin (US 2002/0009627).

Regarding claim 5, Kosako discloses a polymer electrolyte membrane for a fuel cell as recited in paragraph above. However, Kosako does not disclose a fuel cell that utilizes methanol or methanol water mixture as a fuel.

Smotkin discloses the utilization of methanol as a fuel for a fuel cell. See figure 1. Therefore, it would have been obvious to one of ordinary skill in the art to utilize methanol as a fuel with the fuel cell of Kosako because Smotkin teaches that methanol can be used as a fuel for a fuel cell without utilization of a reformer to convert the fuel to a hydrogen-rich fuel gas. See paragraph 5.

Regarding claim 6, Kosako teaches that air (atmospheric oxygen) is utilized as an oxidant gas in a fuel cell. See paragraph 2.

Regarding claim 7, Kosako discloses a polymer electrolyte membrane for a fuel cell as recited in paragraph above. However, Kosako does not disclose a fuel cell that comprises a free cathode compartment.

Smotkin discloses a MEA fuel cell comprising a graphite flow field region (free cathode compartment). See figure 1. In this region the water is expound from the fuel cell. See figure 1. Therefore, it would have been obvious to one of ordinary skill in the art to utilize the graphite flow field region with the MEA fuel cell of Kosako because Smotkin teaches that water is expelled in effort not to flood the fuel cell.

(10) Response to Argument

Applicant argues:

a) The rejection refers to Fig. 12B of Kosako that shows bumps 99 on the anode and cathode diffusion layers 93 and 95 said to constitute a structure that anticipates the instant invention.

The following discussions utilize the Pre-Grant Publication (US2004/0209155) as a translation of the international application WO2003/081707.

Initially, the Examiner points to the rejection above which does not discuss Figure 12B. However, the invention of Kosako et al. is not depicted in Figure 12B. "Fig. 12B is an enlarged sectional view of the main part of the *related art* electrolyte membrane-electrode assembly after thermo-compression bonding." See [0037]. On the contrary, Fig. 1A and Fig. 1B illustrate an MEA of the invention of Kosako et al. "Electrically insulating particles 12 are dispersed in a polymer electrolyte membrane 11, and the

particles 12 intervene between an anode 17 and a cathode 18 to serve as spacers between the electrodes. When gas diffusion layers 13 and 15 have projections 19 on the surfaces contacting anode-side and cathode-side catalyst layers 14 and 16, the particles 12 prevent the breakage of the polymer electrolyte membrane 11 and separate the anode 17 from the cathode 18, such that there is a certain interval between them even where they come closest to each other, as shown in the enlarged view of Fig. 1B." See [0061].

b) The structure that is being cited as anticipatory is not only part of the Background, but it is a structure that is recognized as nonfunctional and to be avoided.

It is agreed that Figure 12B is nonfunctional. However, Figure 12B is not the invention of Kosako et al, as discussed above. Figure 1, which depicts projections 19 *not in contact with the opposing electrode*, is the invention of Kosako et al. Short outs would not occur in the embodiment of Figure 1 because there is no contact between opposing electrodes as is of course present in the nonfunctional related art of Figure 12B.

c) Claim 4 recites a method of operating a fuel cell where the cathode has a diffusion layer 3a "engaging directly against the membrane" 1, whereas Kosako has a cathode diffusion layer 95 separated by a catalyst layer 96 from the membrane 91, except when the fuel cell is defective and bumps 99 on the diffusion layer engage through the membrane 91 and short out the unit.

As discussed above, Kosako et al. disclose a fuel cell where the membrane directly engages the gas diffusion layer as depicted in Figure 1. And once more, Figure

12B is not pertinent as it is *related prior art* which Kosako et al. are simply showing as a defective fuel cell design from which their design has avoided by including the particles 12 to prevent the breakage of the polymer electrolyte membrane 11.

d) The novelty of the instant invention was originally recognized by the examiner with the statement in the Office Action of 17 June 2008 that "the prior art does not disclose or suggest the catalyst layer of the cathode is bound directly on the free cathode compartment."

While the statement was made, this statement was in regard to claim 2. Importantly, claim 2 recited "bound directly on the free cathode compartment," which is not equivalent to "bounding a free cathode compartment."

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Steven Scully/

Examiner, Art Unit 1795

Conferees:

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795

/PATRICK RYAN/

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